handled as I have outlined, with a ton and one-quarter of wheat bran purchased, will furnish ample food a year for a cow that will make 300 pounds of butter, and that the hay, the bran and the ensilage fed as I have suggested will furnish rations nearly identical to those that science has indicated as being most economical in production and also giving the largest amount in returns, and I can not help but believe that the succulence of the ensilage will contribute largely in making all the food more digestable, and so of increased value. There may be better ways than I have outlined, but when the dairymen of Wisconsin have learned how to keep a 300 pound butter cow for every two acres of land devoted to dairy purposes, by purchasing a ton and a fourth of bran per cow they will have taken a long step toward cheapening production, and will receive full value in money returns for food consumed.

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DAIRYING FOR PROFIT.

By E. G. FULLER, Calumet County, Wis.

Third Paper,

Elements of Success.—The subject assigned me is a large one—so large in fact, that in the time allotted me, I can only give a glance at some of the elements which contribute to success, and hence to profit in this branch of agriculture.

The first thing to be considered in this connection is the man. It is a broad truth that no man can attain the highest success in any calling unless he has a natural love for the business or profession in which he may engage. Having this, he will naturally strive to gain all the knowledge possible in regard to his profession; not simply for the purpose of making his business more profitable, but because it is a pleasure to acquire this knowledge. When our labor gives us pleasure, half of its wearying effects are taken away.

Love for the Calling.—The man who would attain the highest success in dairying, must have a natural love for the calling. He should be fond of animals; because if he is not, he will not be likely to give them the kind and considerate treatment which is an important element in the care of the dairy herd. Some one of the institute workers has said, that the whole story of the care of the dairy cow was summed up in one word, “comfort.” That about tells the story; and it takes a man who naturally loves his animals to look carefully to their comfort.

Who of us does not know so-called dairymen who approach their resting animals with a kick and an oath, when about to milk them? Who has not seen some fool of a man tie up a nervous cow and pound her, in order to break her of kicking or running away, when careful and judicious treatment was required? Such a man has no place in the dairy.

Requisites of Success.—The dairyman should be a man of intelligence, of education, and of business ability.
Only a few days ago, in an institute, the author heard a paper read by an ex-county superintendent of schools, in which he almost ridiculed the idea of education for a farmer. Agricultural colleges were denounced as a humbug, and the statement made that as soon as the farmer's boy got a bit of education he left the farm, and if he did not he was a fool for not going where he would have an opportunity to use his education to better advantage than he could on the farm. The writer of that article was certainly wise in leaving the farm, if he could find no room thereon for the expansion of his mighty brains.

Knowledge on the Farm.—There seems to me no calling or profession wherein a more varied knowledge can be used to advantage than on the farm. There is none which pays a larger percentage on intelligence, education, and business ability. Nature, mother Earth, responds bountifully to the man who seeks intelligently for her treasures, and it is just in proportion to the intelligence displayed in our calling that our profits are.

The Dairyman's Education.—Think of the diversified knowledge that must be possessed by the dairyman! He must understand the nature of soils, and their adaptation to different crops; he must know how to feed them, that they may not deteriorate in value; in fact he should increase the fertility.

He should know something of that most mysterious of nature's laws, the law of heredity, in order that he may breed intelligently, and thus produce animals that will contribute generously to his profits.

Care — Food — Marketing. — He should understand the anatomy of the animal body, and know the symptoms and remedies for at least the more common diseases among his stock, that he may treat them in case of sickness. He should understand the comparative value of different foods, that he may be able to feed his stock economically.

He should be a business man, and study the markets, so he may purchase what he needs to the best advantage; study the demands of the market, and seek to supply those demands at the time they are most wanted.

Keep Posted. — He should keep posted upon the advances being made in his business. The many agricultural papers, and bulletins of the Experiment Stations, should find their way to his home, and be carefully studied. But not all we read is gospel truth; hence the dairyman should be an experimenter to a certain extent, that he may satisfy himself of the true value of newer methods.

Get Near the Ideal. — No doubt many are saying that I am placing my ideal dairyman very high. Perhaps so; but ideals are always above the real, and it is only by placing ideals high that a high degree of excellence in any profession may be attained. Of course many are pursuing the business of dairying profitably who come far short of the ideal I have sketched, but I believe the nearer the ideal is approached, the more profitable will be the business.

Book Lore on the Farm. — While I believe that a great deal of book lore will always be found profitable on the farm, I would never consider it superior to good common sense, but if I can find a happy combination of the two, I think the union a good one.

Points for Consideration. — Now, I will try to notice a few of the points to be taken into consideration by the man who would pursue the business to the best advantage.

First, he should consider the branch of the business to which he would de-
vote his energies—whether to the production of milk, cream, cheese or butter. Of course his location must do much toward shaping his decision in the matter.

The Sale of Cream—For city use is undoubtedly the most profitable way of disposing of dairy products, but comparatively few can secure this method.

Butter Making.—If butter is to be his specialty, he should decide how the product is to be manufactured, whether at home, or at the factory. While the latter system will prove a great labor saver, and in nineteen cases out of twenty the more profitable, the private dairyman who will throw himself energetically into his business, make a first class product, and market it in a business-like manner, will undoubtedly make the greater success. Of course no one thinks of producing cheese except upon the factory system.

Selecting the Cow.—Having decided upon the branch of dairying he is to pursue, he should select a cow adapted to the business, and breed her in a manner not only calculated to reproduce her kind, but to improve upon her. It may be urged that the average farmer about to engage in the dairy business, cannot afford to purchase thoroughbreds of any breed, nor is this necessary. Secure good native or grade cows, test them that you may be sure of their capacity, keep none but good ones; aim to secure a herd that will produce an average of not less than 300 pounds of butter per annum (the more the better), but the cost of production must not be overlooked. The profitable animal is the one that produces the most at the cheapest prices. Such a herd can not be picked up in a day. It must come as the result of careful breeding and selection. The herd should be headed by a thoroughbred sire carefully selected from the breed decided upon. He may be used five or six years, then another from the same breed and same general family should be selected. By careful and judicious selection, in a few years an excellent herd may be built up. As well expect to win the Derby with a Percheron as to expect to attain the highest success in dairying with a general-purpose cow.

In the East many dairymen do not try to breed their own animals, but depend entirely upon purchases to keep up the herd. Some make money by purchasing fresh cows, feeding them heavily for a single year, and at the end of their milking season turning them off for beef.

This is not what would be termed high class dairying, nor do I think it as profitable as where a man breeds his own animals judiciously.

Defective Stables.—Next we will consider something of the care to be given the herd.

Comparatively few of our stables are warm enough to keep milch cows to the best advantage. Warmth not only conduce to a more liberal flow of milk, but it also decreases the food consumption. The same food required to support two animals who have only the shelter afforded by a shed or the warm side of a straw stack, will support three warmly stabled.

Many of our stables are ventilated by a half inch crack every 12 inches, but when stables are of proper warmth, there is often a ventilation so that upon entering the stable, the smell that greets one is anything but pleasant. This is a matter that needs attention, as the health of the animal and the purity of the product depends largely upon the neatness of their quarters.

Warm Water—In winter for milch cows is another innovation, looked upon by many as a sort of hot-house method of heating cows. But the experience of the hundreds of dairymen who have
Dairying for Profit.

try it is so strongly in its favor that it can no longer be considered an experiment, but a steamer or tank heater will be considered a part of very well regulated dairyman's outfit.

Economical Feeding — Is another and very important point to be considered in the matter of profit in dairying; and it opens up a big field for study and investigation.

Judging from what I can learn through the mediumship of books, more progress has been made in the science and art of feeding during the past decade, than had been made in a century previous. Farmers are waking up to the fact that there is a science as well as an art in their vocation.

The educated minds of the nineteenth century are turning their investigations to the benefit of the farmer; and no matter how much the masses may scoff at these "scientific fellers" and book farmers, there are but few of us who are not, to a greater or less extent, reaping the benefits of their investigations.

Summering and Wintering. — Many farmers (but few if any of that kind are before me to-day) still pursue the old expensive way of keeping their stock through summer on pasture, and winter on hay and straw.

Their cows give milk through six or seven months of the year, and are kept through the winter at a positive loss.

The class that a few years ago recognized the need of succulent food to maintain their animals in thrifty condition, and supply this by means of growing root crops, has now found that the silo supplies the needed element at a far less cost.

A careful study of the wants of the cow, and the composition of feed stuffs have given us a clearer idea of what to feed and how to feed it in order to produce the best results.

Corn Fodder — Has formed no inconsiderable portion of dairy rations in the East for some years; yet we are just beginning to understand its value. When planted as it has been, sown broadcast at the rate of two or three bushels per acre, or planted in drills so thickly that no attempt was ever made to form an ear, no remarkable results were obtained; but to-day, with the methods of planting now in vogue, when eight quarts of seed will suffice for an acre, and eight to fifteen tons can easily be grown to the acre, each ton worth as much, pound for pound, as good timothy hay, we cannot shut our eyes to the fact that an important element has been introduced into our dairy husbandry.

The Silo. — But our corn fodder is difficult to cure and handle to the best advantage. The silo here steps in and offers an opportunity to store our fodder in the best possible space, and to preserve it in the best condition for feeding. It gives us a green, succulent food, upon which cows thrive well, and give as full a flow of milk as upon summer pasture. But in feeding ensilage it should be remembered that we are feeding a summer food, and must approach as near as possible to summer conditions in the care of the animals. A warm stable is a necessity in feeding this kind of food.

Improved Methods. — Not only has modern investigations improved our methods of manufacturing dairy products, raised the standard of quality, decreased the cost of production by means of cheaper food, and more intelligent use of food; but careful breeding and scientific feeding has largely increased the capacity of our cows, just as breeding and training has developed the modern trotting horse.

A Well-Balanced Ration. — Care and intelligence are needed in forming a
proper ration for an animal. The two
most important points to be considered
are how to secure a well-balanced ration,
_\textit{i.e.}\_ one which shall furnish to the ani-
mal the proper proportion of carbo-
hydrates and albuminoids. The one to
keep up the animal heat and supply the
bodily waste; the other to be turned in-
to fats and returned to us in the form of
flesh or milk. But many combinations
can be made which will supply these
elements in the proper proportion and
the point dairymen must study is how
to make up such a ration at the mini-
 mum cost.

Of course those of us who have been
brought up on a farm, and have had the
advantage of years of observation and
experience, have learned by actual trial
what combinations give good results,
and we would not be found giving a
milch cow a heavy feed of corn meal
when the forage being fed was rich corn
fodder or ensilage, nor trying to balance
a forage feed of straw or timothy with
bran alone.

**Rations Must Be Tested.** A Ger-
man chemist named Wolff, has given us
a table of feeding standards, based up-
on the composition of animal bodies,
and their products. But while this may
serve us as a partial guide, combined
with the analyses of feed stuffs, all the
deductions can not be accepted as abso-
lute. In fact, there is a chemistry of
nature which none of us can understand,
and the rations given us must be sub-
jected to actual trial and comparison,
before we can reach a final conclusion
as to their utility.

**Chemical Analysis.** A striking ex-
ample of the lack of chemical analysis
to do justice to the merits of a forage ra-
ton is found in the feeding results ex-
perienced with ensilage. In nearly
every case actual trial has shown it to be
superior to what chemical analysis had
claimed for it.

Now chemists tell us, that if properly
handled, ensilage develops lactic acid
while in the silo, that this in itself is a
stage of digestion, hence requires a less
expenditure of energy to digest, _ergo_, we
got better results from a stabled quan-
tity of green forage ensiloed, than from
the same quantity fed in a green state.
Is this true? Some first class practical
men claim it for a fact, but it will still
bear investigation.

**Ensilage as a Ration.** Be that as it
may, ensilage certainly forms the basis
for the cheapest ration that can be fed
our dairy stock. Contrast the cost of a
ration with ensilage as a basis, with any
other food that we can feed a cow, and
note the great balance in favor of the
ensilage ration; and when we remember
that the practical results are in fa-
vor of the cheap food, I cannot see how
our dairymen can hesitate to adopt this
method of supplying their cows with
forage.

**Model Rations.** Here is a model
ration given by Wolff, for milch cows:

<table>
<thead>
<tr>
<th>Item</th>
<th>lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meadow hay</td>
<td>12</td>
</tr>
<tr>
<td>Oat straw</td>
<td>6</td>
</tr>
<tr>
<td>Manure's grubs.</td>
<td>25</td>
</tr>
<tr>
<td>Brewer's bran.</td>
<td></td>
</tr>
<tr>
<td>Cotton seed cake</td>
<td>2</td>
</tr>
</tbody>
</table>

At a moderate estimate this ration
will cost 25c. per day.

Here is another compiled from his
tables:

<table>
<thead>
<tr>
<th>Item</th>
<th>lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cured corn fodder</td>
<td>20</td>
</tr>
<tr>
<td>Rye straw</td>
<td>5</td>
</tr>
<tr>
<td>Malt sprouts</td>
<td>6</td>
</tr>
<tr>
<td>Cotton seed cake</td>
<td>2</td>
</tr>
</tbody>
</table>

This is a much cheaper ration, costing
1c. per day, and in my opinion would
not prove a good practical ration for a
cow.

Another ration compiled from Wolff's
tables:

<table>
<thead>
<tr>
<th>Item</th>
<th>lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn fodder</td>
<td>15</td>
</tr>
<tr>
<td>Bran</td>
<td>5</td>
</tr>
<tr>
<td>Malt sprouts</td>
<td>5</td>
</tr>
<tr>
<td>Corn meal</td>
<td>3</td>
</tr>
<tr>
<td>Cotton seed meal</td>
<td>_</td>
</tr>
</tbody>
</table>
This will cost about 15c. per day, and make a good practical ration, but too expensive.

It is useless to extend this list. Any leading agricultural paper contains plenty of these rations based on the German tables, Prof. E. W. Stewart supplying several papers with combinations, which will contain in a given quantity the proper quantity of the three elements—carbohydrates, albuminoids and fat. But while these rations may be very well to theorize upon, as a rule they are too expensive to be practical.

The Nutritive Ratio.—These standards call for a nutritive ratio of one to five for a milch cow. That is one part of protein to 5 of carbohydrates and fat.

The protein is the most expensive element to purchase in foods and some of our best dairymen get excellent results, by feeding a ration in which the nutritive ratio is only about 1 to 4. The cost is much lessened and it is a question if the results are as good.

The Tables Theoretical.—These tables are theoretical. Prof. Stewart’s rations are theoretical, based on these tables. Now comes in the dairymen’s part. He can well afford to be an experimenter to a certain extent, in order to satisfy himself of the practical utility of these standards.

Prof. Armsby’s Ration.—Here is a ration compiled by Prof. Armsby from the tables:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn ensilage</td>
<td>30</td>
</tr>
<tr>
<td>Clover</td>
<td>10</td>
</tr>
<tr>
<td>Corn meal</td>
<td>5</td>
</tr>
<tr>
<td>Bran</td>
<td>5</td>
</tr>
<tr>
<td>Oil meal</td>
<td>2</td>
</tr>
</tbody>
</table>

At present prices this ration will cost 10c. per day—too much for the practical dairymen.

Cost of Feeding.—Several of our Wisconsin dairymen manage to feed cows at a cost of from 7 to 10 cts. per day by making ensilage the basis of their ration, which, with the addition of a few pounds of bran, shorts or pea meal, will give excellent results. The last mentioned food is one that is deserving of more attention.

Pea Meal and Bran.—A year ago, upon my father’s farm, we had to depend principally upon marsh hay as a forage ration. We had quite a large quantity of peas, and instead of selling our peas, originally intended, we ground several tons—mixed equal quantities by weight, of pea meal and bran, and secured the best results of any grain combination we could make.

Summer Feeding.—Is also a place where we can make decided improvements. At the price of our Wisconsin farm lands, we can scarcely afford to depend upon pasture as our only summer food. A light grain ration and a practical feed of soil ing crops and perhaps of ensilage will be found a measure of economy. Rye, corn, peas and oats, clover, millet or Hungarian grass can be used to advantage for this purpose.

Economy of Labor.—Another thing we should do is to study economy of labor in the arrangement of our buildings. This is too often neglected, and the labor of caring for our stock made double what it ought to be.

If the farmer is to make butter, he should have a neat and convenient dairy house, well supplied with all the modern conveniences in butter making, and put upon the market nothing but a first class product. Let every package go into the market with his own name upon it, and let that name stand for a synonym of the purity and fine quality of the contents of the package. In time he will find that it will give an added value to every package.

Object of Paper.—The object of this paper has not been so much to give specific directions or instruction upon any particular point in dairying, as to
awaken thought all along the line. And when a man gets to thinking seriously and earnestly upon any topic, he is on the right road to success.

EQUALIZING DAIRY PRODUCTION.

By Hon. HIRAM SMITH, Sheboygan County, Wis.

Expensive Methods.—The underlying principle of all farmers' institutes, dairymens' conventions and agricultural conventions, is the supposition or knowledge of the fact that many of the methods and processes pursued by the farmers of this State, and all other States, are expensive, which are pursued continually at immense loss. If all the farmers of this State had been practicing upon sound scientific principles, their labor all well paid, their methods of feeding such that nothing should be wasted, and no losses sustained, selling their products at proper times so that no waste is realized in that direction, we would have no necessity for farmers' institutes. But because that is not true, is the reason of the farmers' institutes, that in this way we may study facts by which we can correct our errors, and, therefore, I wish to point out, on this occasion, a few of the errors that a great mass of the dairymen in this State are guilty of without any profit to themselves, without saving in labor, without doing anybody any good whatever. They are constantly wasting a very large percentage of the products they get out of the soil and out of their cattle.

Summer Dairying.—First, the great mass of dairymen in this State are engaged in summer dairying. Their cows commence to give milk about the last of April, or the first of May, running until cold weather; then they dry off, and the winter product amounts to but very little.

There are a few exceptional localities that have learned better in that respect. Now, I know something about this, for I have paid a heavy tax of waste in pursuing this same course. You all know the difficulty of marketing butter in the summer is very great. You read the market reports, and you see that nearly all winter butter has sold for thirty and thirty-five cents, while nearly all last summer it was fifteen and sixteen cents.

Now, you know without my telling you, that the great body of the milk is gathered in May, June and July. Cows will give a big flow of milk then; they are having the best feed of the year, the best you have got. You can hardly find a poor cow at that time of year. Your cow is giving a large flow of milk, you are taking the milk to the factory, it is being manufactured into butter and cheese, and when the sales are made, they are the lowest of the entire season.

We were brought up to do business in this way; we knew of no other way, and a good many of us can scarcely see how we can avoid it; but is there any motive to avoid it? Most certainly. There is